

# NOTES ON LOUSE-HOST ASSOCIATIONS OF THE GREAT SALT LAKE DESERT WITH KEYS TO THE LICE

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## INTRODUCTION

This study is concerned with the sucking lice of mammals, exclusive of bats, found in the southern arm of the Great Salt Lake Desert in northwestern Utah. The region includes the western parts of Box Elder, Tooele and Juab Counties. Contained in the keys are nineteen species of lice representing eight genera, which include those collected in this area as well as those known to occur on the same hosts in adjacent areas. These lice occur on twenty-two of the thirty-four species of mammals found in the study area. There are twenty-four genera of mammals of which the rodents account for approximately two-thirds of the total species. The numerical associations of lice and mammals are listed in Table I.

TABLE I  
Numerical associations of the lice and mammals.

Host Order	Number of Mammal Species	Number of Louse Species
Lagomorpha	3	1
Rodentia	22	16
Carnivora	7	1
Artiodactyla	2	1

Table I indicates that the majority of the lice in this area have been found on the rodents. Of seven species of carnivores only one is known to carry lice.

The lice associated with the rodents are restricted to the families Cricetidae, Sciuridae, Muridae, and Heteromyidae. In these families the greatest number of louse associations per species of host represented occurred in the family Muridae (1 host, 3 lice). The Sciuridae, Cricetidae, and Heteromyidae follow in the order listed. These numerical associations are presented in Table II.

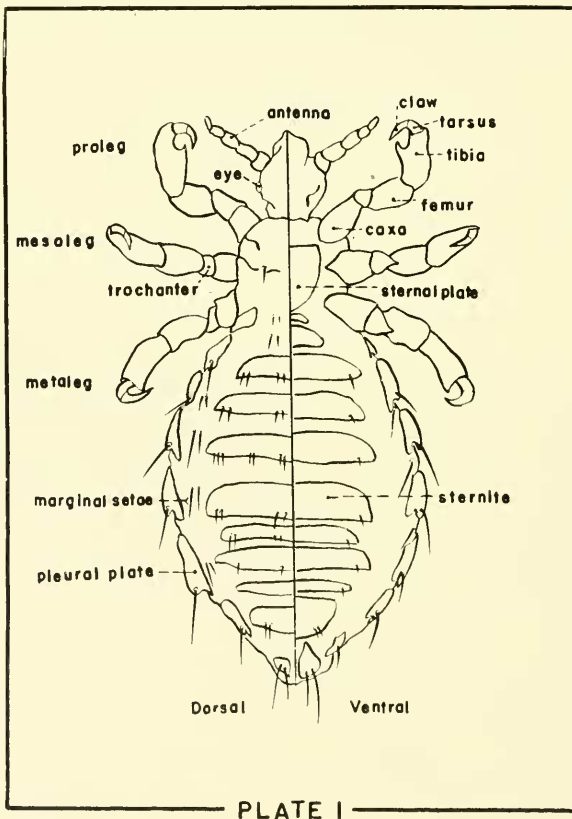
TABLE II  
Louse associations of the families of rodents of the  
Great Salt Lake Desert.

Rodent		Louse Species	Rodent-louse Associations
Family	Species		
Muridae	1	3	3
Sciuridae	5	6	10
Cricetidae	8	8	11
Heteromyidae	6	3	6

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The following sources were utilized in preparing the key and louse-host list: Ferris (1916, 1919-1935, 1951); Kellogg and Ferris (1915); Hopkins (1942); Durrant (1952).

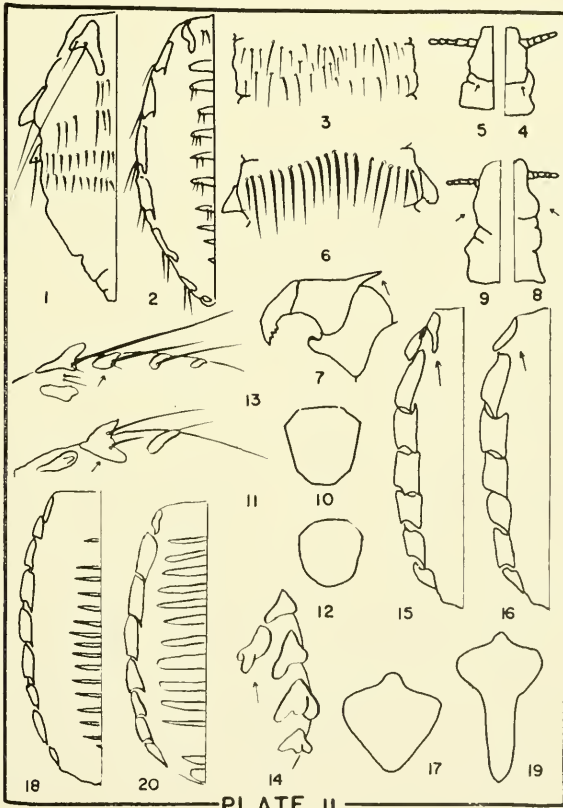
The figures of each plate are arranged so that the top or left of each plate points cephalad. In some cases a small arrow designates the particular characteristics under consideration. A notation such as "II-1" in the key refers to figure one as depicted on plate II. In the keys and louse-host list, the presence of one asterisk after the louse species indicates an association which is known from other areas, but has not yet been found to occur in the Great Salt Lake Desert. Two asterisks denotes the recovery of the species from the host in the southern part of the Great Salt Lake Desert.



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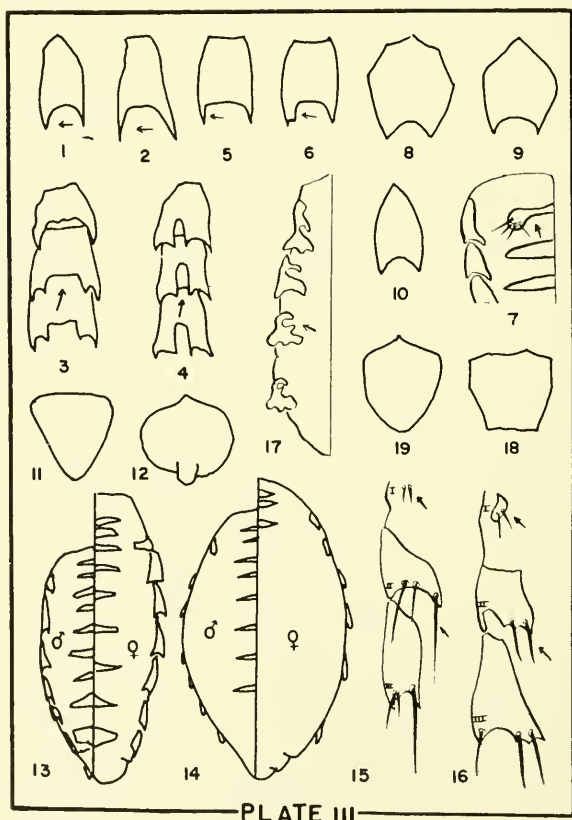
ILLUSTRATED KEY TO THE SUCKING LICE KNOWN OR SUSPECTED TO OCCUR IN THE GREAT SALT LAKE DESERT

- 1. Pleural plates of second to seventh abdominal segments absent or reduced; abdomen membranous except in the genital region. (Fig. II-1) ..... 2
- 2. Pleural plates of second to seventh abdominal segments present and well developed (Fig. II-2), except in *Neo-haematopinus laeviusculus* where they are modified as hook-shaped sclerites (Fig. III-17); abdomen not membranous ..... 6
- 2. Abdominal segments with more than one row of setae per segment (Fig. II-3); occiput produced into thorax (Fig. II-4); occurring on coyotes, Genus **LINOGNATHUS**: one species ..... setosus\*
- Abdominal segments with one row of setae per segment (Fig. II-6); occiput not produced into thorax (Fig. II-5); not occurring on coyotes ..... 3



- 3. Pleural plates distinctly present on the second to fourth abdominal segments (Fig. II-1); meso- and metatarsi

- projected into point at outer basal angle (Fig. II-7);  
occurs on rodents, Genus FAHRENHOLZIA ..... 5
- Pleural plates absent or when present reduced to minute  
plates; tarsi not as described above; occurs on the Lago-  
morpha and Artiodactyla ..... 4
4. Head with distinct, rounded, posterior antennal angle (Fig.  
II-8); occurs on the black-tailed jackrabbit and the Audu-  
bon cottontail, Genus HAEMODIPSUS: one species ..... setoni\*\*
- Head without distinct, rounded, posterior antennal angle  
(Fig. II-9); occurs on the mule deer, Genus SOLENOP-  
TES: one species ..... ferrisi\*
5. Sternal plate octagon-shaped (Fig. II-10); with definite  
sides, pleural plate of the third segment of the largest  
single abdominal sclerite (Fig. II-11); the shortest seta



of the paired setae on this plate one-fourth of the length  
of the long seta; occurs on the little pocket mouse, Great  
Basin pocket mouse and the Ord kangaroo rat ..... pinnata\*\*

Sternal plate oval-shaped without definite sides (Fig. II-  
12); pleural plate of the third segment not the largest

- single sclerite (Fig. II-13); the shortest seta of the paired setae of this plate less than one-sixth the length of the long seta; occurs on the Great Basin pocket mouse and the long-tailed pocket mouse ..... *reducta*\*\*
6. Second abdominal sternite with a posterior-projecting process (Fig. II-14); ventral abdominal segments with one row of setae per segment (Fig. II-6); head without a deeply indented post-antennal angle (Fig. II-9); occurring primarily on ground squirrels, Genus *ENDERLEINEL-LUS* ..... 7
- Second abdominal sternite without a posterior-projecting process; ventral abdominal segments with one or more rows of setae per segment (Fig. II-3); head with a definite indented post-antennal angle (Fig. II-8) ..... 8
7. Two to four setae on the second abdominal tergite; setae short and stout, generally few in number; fourth abdominal tergite on males with two to six long setae in the median group; occurs on the rock squirrel ..... *osborni*\*
- Nine to eighteen setae on the second abdominal tergite; setae long and slender; males without long setae in the median group; occurs on the Townsend and antelope ground squirrels ..... *suturalis*\*\*
8. First pair of abdominal pleurites located on the dorsum (Fig. II-15); Genus *HOPLOPLEURA* ..... 9
- First pair of abdominal pleurites located laterally (Fig. II-16) ..... 12
9. Sternal plate shieldlike (Fig. II-17); length of posterior point less than one-half the greatest width of the plate; tergites and pleurites separated by more than three times the width of the widest tergite (Fig. II-18) ..... 10
- Sternal plate arrow-head shape (Fig. II-19); posterior point more than one-half the greatest width of the plate; tergites and pleurites separated by less than three times the width of the tergite (Fig. II-20) ..... 11
10. Lobes of the pleural plates of the fourth abdominal segment at least one-third the length of the plate on which they are borne (Fig. III-2); occurs on the least chipmunk and the northern grasshopper mouse ..... *arboricola*\*\*
- Lobes of the pleural plates of the fourth abdominal segment less than one-third the length of the plate on which they are borne (Fig. III-1); occurs on the Townsend ground squirrel and the cliff chipmunk ..... *erratica*\*\*
11. Dorsal marginal setae present (Fig. I); notch of the third pleural plate less than twice as long as wide (Fig. III-3); occurs on the long-tailed meadow mouse and the house mouse ..... *acanthopus*\*
- Dorsal marginal setae absent; notch of the third pleural plate at least twice as long as wide (Fig. III-4); occurs on the long-tailed pocket mouse, white-footed deer mouse, northern grasshopper mouse, pinyon mouse, canyon mouse, house mouse, and the western harvest mouse *hesperomydis-reithrodontomydis* complex ..... 11a
- 11a. The males of *hesperomydis* and *reithrodontomydis* appear to be identical. The females may be separated as follows: Dorsal lobe of pleurite seven definitely acute apically (Fig. III-5) ..... *hesperomydis*\*\*
- Dorsal lobe of pleurite seven broad and apically truncate (Fig. III-6); occurs on western harvest mouse ..... *reithrodontomydis*\*\*
12. Ventral abdominal segments with at least eight setae per row; second abdominal tergite posteriorly emarginate in

- the males (Fig. III-7); sternal plate emarginate posteriorly (Figs. III-8, 9, 10); or with a posterior projecting process (Fig. III-2); or triangle-shaped; occurs on ground squirrels and wood rats, Genus NEOHAEMATOPINUS ..... 13
- Ventral abdominal segments with five to seven setae per row; second abdominal tergite not posteriorly emarginate in the males; sternal plate not emarginate posteriorly or with a posterior projecting process (Figs. II-11, 18, 19); occurs on mice, Genus POLYPLAX ..... 17
- 13. Sternal plate posteriorly emarginate (Fig. III-8, 9, 10) ..... 14
- Sternal plate rounded or pointed posteriorly, never emarginate (Fig. III-12) ..... 16
- 14. Abdominal tergites present in males and females, often reduced in the females (Fig. III-13); occurs on ground squirrels ..... 15
- Abdominal tergites reduced or absent in females and reduced in the males (Fig. III-14); occurs on the bushy-tailed wood rat ..... inornatus\*
- 15. Pleural plate one absent, represented by a setal group (Fig. III-15); second pleural plate triangle-shaped with three setae evenly spaced along the edge of the pleurite; at least one seta of this group longer than the greatest length of the plate; occurs on the antelope ground squirrel ..... citellinus\*\*
- Pleural plate one small, but definitely present (Fig. III-16); second pleural plate rectangle-shaped with paired setae located on the inner third of pleurites; setae no longer than the greatest length of the plate; occurs on the Townsend ground squirrel ..... pacificus\*
- 16. Sternal plate hexagonal in shape with posterior projection (Fig. III-12); pleural plates modified as hook-shaped sclerites (Fig. III-17); occurs on the rock squirrel ..... laeviusculus
- Sternal plate triangular in shape with the angles rounded; posterior margin truncate, projection absent; pleurites not reduced to hook-shaped sclerites; occurs on the desert wood rat ..... probably new species\*\*
- 17. Sternal plate pear-shaped with the anterior corners rounded; occurs on the house mouse ..... serrata\*
- Sternal plate not pear-shaped ..... 18
- 18. Sternal plate concave anteriorly, posterior edge truncate (Fig. III-18); occurs on the white-footed deer mouse ..... auricularis\*\*
- Sternal plate not concave anteriorly; posterior edge not truncate (Fig. III-19); occurs on the long-tailed meadow mouse ..... abscisa\*

HOST KEY TO THE SUCKING LICE KNOWN OR SUSPECTED TO OCCUR ON MAMMALS, EXCLUSIVE OF BATS, OF THE GREAT SALT LAKE DESERT

- Occurs on:
- 1. Rodents ..... 4
  - Other mammals ..... 2
  - 2. Rabbits: Audubon cottontail (*Sylvilagus audubonii*) and the black-tailed jackrabbit (*Lepus californicus*) ..... Haemodipsus setoni Ewing\*\*
  - Other mammals ..... 3

3. Mule deer ( <i>Odocoileus hemionus</i> ) .....	Solenoptes ferrisi Fahrenholzia*	
Coyote ( <i>Canis latrans</i> ) .....	Linognathus setosus Olfers*	
4. Squirrels and chipmunks (family <i>Sciuridae</i> ) .....		5
Mice and rats (families <i>Heteromyidae</i> , <i>Muridae</i> and <i>Cricetidae</i> ) ..		8
5. Chipmunks: cliff chipmunk ( <i>Eutamias dorsalis</i> ) and the least chipmunk ( <i>Eutamias minimus</i> ) .....	Hoplopleura arboricola Kellogg and Ferris**	
Rock and ground squirrels .....		6
6. Rock squirrel ( <i>Citellus variegatus</i> ) .....	Neohaematopinus laeviusculus Grube*	
	Enderleinellus osborni Kellogg and Ferris*	
Ground squirrels .....		7
7. Antelope ground squirrel ( <i>Citellus leucurus</i> ) .....	Neohaematopinus citellinus Ferris**	
	Enderleinellus suturalis Osborn**	
Townsend ground squirrel ( <i>Citellus townsendii</i> ) .....	Neohaematopinus pacificus Kellogg and Ferris**	
	Neohaematopinus laeviusculus Grube**	
	Hoplopleura arboricola Kellogg and Ferris*	
	Enderleinellus suturalis Osborn*	
8. Heteromyidae (pocket mice and kangaroo rats) .....		9
Muridae and Cricetidae .....		11
9. Pocket mice ( <i>Perognathus</i> spp.) .....		10
Ord kangaroo rat ( <i>Dipodomys ordii</i> ) .....	Fahrenholzia pinnata Kellogg and Ferris**	
10. Great Basin pocket mouse ( <i>Perognathus parvus</i> ) .....	Fahrenholzia pinnata Kellogg and Ferris**	
	Fahrenholzia reducta Ferris**	
Little pocket mouse ( <i>Perognathus longimembris</i> ) .....	Fahrenholzia pinnata Kellogg and Ferris**	
Long-tailed pocket mouse ( <i>Perognathus formosus</i> ) .....	Fahrenholzia reducta Kellogg and Ferris**	
11. House mouse ( <i>Mus musculus</i> ) .....	Hoplopleura hesperomydis Osborn*	
	Hoplopleura acanthopus Burmeister*	
	Polyplax serrata Burmeister*	
Other rats and mice .....		12
12. Wood rats ( <i>Neotoma</i> spp.) .....		13
Other rodents .....		14
13. Desert wood rat ( <i>Neotoma lepida</i> ) .....	Neohaematopinus sp.**	
Bushy-tailed wood rat ( <i>Neotoma cinerea</i> ) .....	Neohaematopinus inornatus Kellogg and Ferris*	
14. White-footed mice ( <i>Peromyscus</i> spp.) .....		15
Other mice (grasshopper, harvest and meadow mice) .....		16
15. Canyon mouse ( <i>Peromyscus crinitus</i> ) .....	Hoplopleura hesperomydis Osborn**	
Deer mouse ( <i>Peromyscus maniculatus</i> ) .....	Hoplopleura hesperomydis Osborn**	
	Polyplax auricularis Kellogg and Ferris**	
Pinyon mouse ( <i>Peromyscus truei</i> ) .....	Hoplopleura hesperomydis Osborn**	
16. Long-tailed meadow mouse ( <i>Microtus longicaudus</i> ) .....	Hoplopleura acanthopus Burmeister*	
	Polyplax abscisa Fahrenholzia*	
Northern grasshopper mouse ( <i>Onychomys leucogaster</i> ) .....	Hoplopleura hesperomydis Osborn**	
	Hoplopleura arboricola Kellogg and Ferris**	
Western harvest mouse ( <i>Reithrodontomys megalotis</i> ) .....	Hoplopleura reithrodontomydis Ferris**	

HOST-LICE ASSOCIATIONS OF MAMMALS,<sup>2</sup>  
EXCLUSIVE OF BATS, OF THE GREAT SALT LAKE DESERT

- Canis latrans* (coyote)  
    *Linognathus setosus* Olfers\*
- Citellus leucurus* (antelope ground squirrel)  
    *Neohaematopinus citellinus* Ferris\*\*  
    *Enderleinellus suturalis* Osborn\*\*
- Citellus townsendii* (Townsend ground squirrel)  
    *Neohaematopinus pacificus* Kellogg and Ferris\*  
    *Neohaematopinus laeviusculus* Grube\*\*  
    *Hoplopleura arboricola* Kellogg and Ferris\*  
    *Enderleinellus suturalis* Osborn\*
- Citellus variegatus* (rock squirrel)  
    *Neohaematopinus laeviusculus* Grube\*  
    *Enderleinellus osborni* Kellogg and Ferris\*
- Dipodomys ordii* (Ord kangaroo rat)  
    *Fahrenholzia pinnata* Kellogg and Ferris\*\*
- Eutamias dorsalis* (cliff chipmunk)  
    *Hoplopleura arboricola* Kellogg and Ferris\*\*
- Eutamias minimus* (least chipmunk)  
    *Hoplopleura arboricola* Kellogg and Ferris\*\*
- Lepus californicus* (black-tailed jackrabbit)  
    *Haemodipsus setoni* Ewing\*\*
- Microtus longicaudus* (long-tailed meadow mouse)  
    *Hoplopleura acanthopus* Burmeister\*  
    *Polyplax abscisa* Fahrenholzia\*
- Mus musculus* (house mouse)  
    *Hoplopleura hesperomydis* Osborn\*  
    *Hoplopleura acanthopus* Burmeister\*  
    *Polyplax serrata* Burmeister\*
- Neotoma lepida* (desert wood rat)  
    *Neohaematopinus* sp.\*\*
- Neotoma cinerea* (bushy-tailed wood rat)  
    *Neohaematopinus inornatus* Kellogg and Ferris\*
- Odocoileus hemionus* (mule deer)  
    *Solenoptes ferrisi* Fahrenholzia\*
- Onychomys leucogaster* (northern grasshopper mouse)  
    *Hoplopleura hesperomydis* Osborn\*\*  
    *Hoplopleura arboricola* Kellogg and Ferris\*\*
- Perognathus formosus* (long-tailed pocket mouse)  
    *Hoplopleura hesperomydis* Osborn\*\*  
    *Fahrenholzia reducta* Ferris\*\*
- Perognathus longimembris* (little pocket mouse)  
    *Fahrenholzia pinnata* Kellogg and Ferris\*\*
- Perognathus parvus* (Great Basin pocket mouse)  
    *Fahrenholzia pinnata* Kellogg and Ferris\*\*  
    *Fahrenholzia reducta* Ferris\*\*
- Peromyscus crinitus* (canyon mouse)  
    *Hoplopleura hesperomydis* Osborn\*\*
- Peromyscus maniculatus* (deer mouse)  
    *Hoplopleura hesperomydis* Osborn\*\*  
    *Polyplax auricularis* Kellogg and Ferris\*\*

2. Arranged alphabetically according to genus



- Peromyscus truei* (pinyon mouse)  
*Hoplopleura hesperomydis* Osborn\*\*  
*Reithrodontomys megalotis* (western harvest mouse)  
*Hoplopleura reithrodontomydis* Ferris\*\*  
*Sylvilagus audubonii* (Audubon cottontail)  
*Haemodipsus setoni* Ewing\*\*

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